

desert (Prakash 1961, Roonwal and Mohnot 1977).

During our eco-ethological studies we have been observing a colony of *Pteropus giganteus* and one bisexual troop of *Presbytis entellus* roosting on a single Banyan tree (*Ficus bengalensis*) at Balsamand, 12 km north of Jodhpur.

Their foraging time is different. Being nocturnal, the fruit bats leave their roost about 30 min. after sunset and return 45 min. prior to sunrise, whereas Hanuman langurs leave their roost about 15 min. before sunrise and return 15 min. after sunset and they spend very little time together and interact.

Two important questions arise from this observation — (1) why they have selected that particular tree, and (2) why this kind of close association occurs in nature.

The reasons of their selection of the banyan tree are:

1. The dense canopy provides protective covering for fruit bats from the scorching sunlight and cover from their predators.

2. Guttation provides coolness to habitants.

3. Flexible and strong branches help langurs for jumping and playing and fruit bats for hanging.

4. Fruits are consumed by both animal species so the tree gives feeding facility.

The possible explanations for their close association are —

(1) To maximise their natural resource (i.e. roosting site) potential.

(2) Utilisation of natural resource (i.e. feeding) and/or resource competition.

This kind of close inter-specific association is possibly because of a lack of alternate suitable roosting facilities.

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REFERENCES

PRAKASH, I. (1961): Taxonomic and biological observations on the bats of the Rajasthan desert. *Rec. Indian Mus.* 59(1 & 2): 149-170.

ROONWAL, M. L. & MOHNOT, S. M. (1977): Primates of South Asia: Ecology, Sociobiology and Behavior. Cambridge, Mass. (Harvard Univ. Press).

3. LEOPARD AND TIGER INTERACTIONS AT ROYAL CHITWAN NATIONAL PARK, NEPAL

Earlier studies in and adjacent to the park found evidence of high leopard mortality. Suitable habitat was not occupied for extended periods, suggesting that the population was experiencing difficulty replacing itself (Seidensticker *et al.* in press). Under certain conditions leopards succeed in co-existing with

tigers, the former being socially subordinate to the latter (Seidensticker 1976). Nevertheless, leopards are not common in habitat where tiger density is high. They are most prevalent on the peripheries of the park, sandwiched between prime tiger habitat, on the one side, and cultivated village land on the

other, dependent on both natural prey and domestic livestock. Tigers as well as humans contribute to leopard mortality.

During a period of 21 months, six leopard deaths were recorded. Although all occurred within 7 km², this does not represent the total area the leopards had used. Five were killed by tigers; the cause of death in the sixth case is unknown. In April, 1986 the remains of a subadult male, estimated to be 18 months old, were discovered in Sal forest at the foot of some hills. Wounds indicated that it had been killed by a tiger, the tracks of which were discovered nearby. Two months later, the decomposed carcass of a large leopard, presumed to be a male, was discovered in nearby riverine habitat; it was not possible to ascertain the cause of death. Ten months after the first leopard had been killed, a female leopard and her two small cubs were walking along a path through grassland near the Rapti River, on the edge of the park, when they were encountered by a tigress. The latter killed the mother leopard, dragged her body 75 metres, and devoured everything except the head and front paws. The two cubs escaped but returned the next night, when the tigress found and killed them not far from where she had fed on their mother. The leopard cubs were discovered seven metres apart, where they had been dragged in opposite directions by the two small (six months old) cubs of the tigress. The skulls of both, one a male and the other a female, weighing 5.7 and 5.2 kilograms respectively, had been crushed; their bodies were intact except for about half a kilogram

of flesh which had been eaten from the hind-quarters of each by the tiger cubs; the tail of one was also missing. During the next 11 months, when the resident female was not replaced, a large male leopard intermittently used the area. In January, 1988 his 4-5 day old remains were discovered in a patch of partially burnt grass. Canine punctures at the nape of the neck, the vertebrae of which were shattered, as well as wounds on the back, left no doubt that he had been killed by a tiger, most probably an adult female.

Two factors appear to have a bearing on the extermination of so many leopards by tigers in one area during a short period of time. First, subsequent to the establishment of the park in 1973 effective protection and good management have led to an increase in the prey base and a commensurate rise in tiger density. In a tract of western Chitwan of just under 100 km², including the smaller area where leopard mortality was recorded, the number of resident breeding adult tigers doubled from four to eight in the 11 years 1976-87. Secondly in this sector, very little peripheral habitat remains available for leopards. As human pressure inside the park has been largely eliminated by protection, it has increased outside, with consequent clearing of adjacent forest and scrubland. Now prime tiger habitat on one side of the Rapti River, the park boundary, faces open terrain with little cover on the other. These factors would increase the likelihood of confrontations between tigers and leopards.

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REFERENCES

SEIDENSTICKER, JOHN (1976): On the ecological separation between tigers and leopards. *Biotropica* 8: 225-234.

McDOUGAL, CHARLES (In press): Leopards living at the edge of Royal Chitwan National Park, Nepal. *Proceedings Centenary Seminar*. Bombay Natural History Society.

4. THE SMALL MONGOOSE FEEDING ON DROPPINGS OF NILGAI

On 23-iv-1988, while I was taking a census of peafowl in Roadside Plantation on S. H. 14 near village Tatarpur in Alwar District, I came across a small Indian mongoose (*Harpistes auropunctatus*) at 1800 hrs, which was wandering under ground cover in the plantation. I kept silent, hiding behind a tree trunk to observe the mongoose's activity. Soon it crossed the road and came towards me under the same *Acacia nilotica* tree whose trunk was serving me as a hide.

After some search, it came to a heap of droppings of Nilgai (*Boselaphus tragocamelus*) lying in the shade of the tree. Soon it picked up one pellet, holding it between its two fore-arms in a squirrel-like manner and completely ate it. While it was trying for a second feed, a motor cycle passed on the road which disturbed the animal and I could not watch further activity.

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REFERENCES

5. AERIAL FEEDING BY MEDIAN EGRET (*EGRETTA INTERMEDIA*), LITTLE EGRET (*EGRETTA GARZETTA*) AND POND HERON (*ARDEOLA GRAYII*)

During August and September, near most of the sluice gates of Keoladeo National Park, Bharatpur, I observed a strange feeding behaviour of egrets and pond herons. This is the time when the Irrigation Department supplies water to the Sanctuary from the Ajanbundi reservoir. This year they started supplying water from 23rd July, 1985. Diagonally placed sluice gates regulate the flow of water into various blocks. Along with water,

schools of fish fry also enter the Sanctuary. During this period, I observed the aerial feeding behaviour of the median egret, little egret and pond heron. The area where this behaviour was noticed was a clear sheet of fast flowing, deep, open water. Five to ten cm. long fish used to leap into the air, apparently throughout the day. Several dead and living *Acacia* trees, overhung this area. Almost every day, I saw about 20 to 25 egrets and